The Science of Macroeconomics

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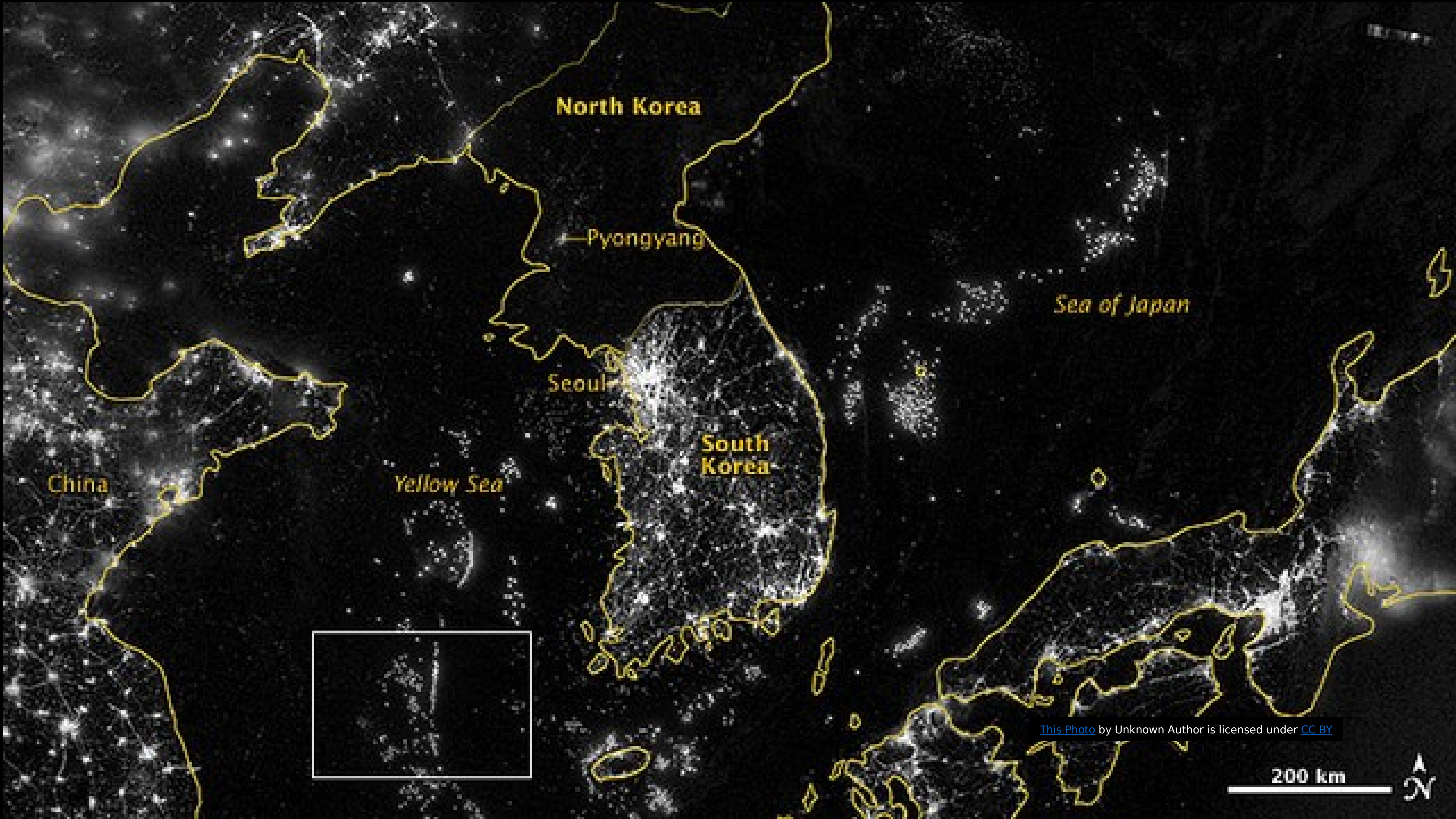
ECON 311 – Intermediate Macroeconomics

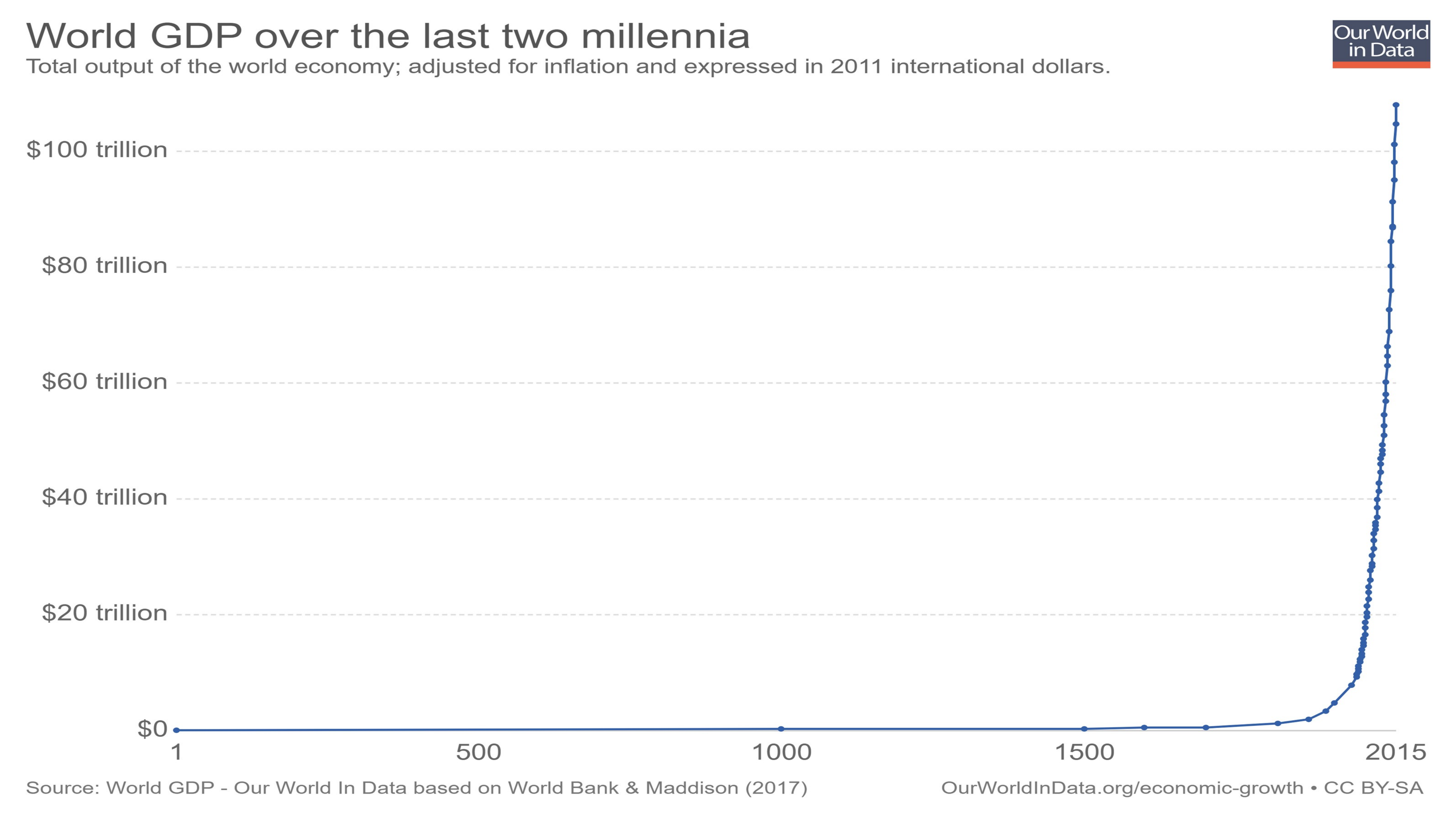
August 23, 2023

What is Macroeconomics?

- Macroeconomics “studies the forces that influence the economy as a whole” (Mankiw, p. 1).
- Macroeconomics seeks to…
  - Describe the structure, performance, and behavior of the economy as a whole
  - Understand the underlying determinates of aggregate trends in the economy
  - Explain the procedural change in the economy by examining the relationship between economic variables
- It seeks to do so, both in the ***short-run*** and in the ***long-run***.

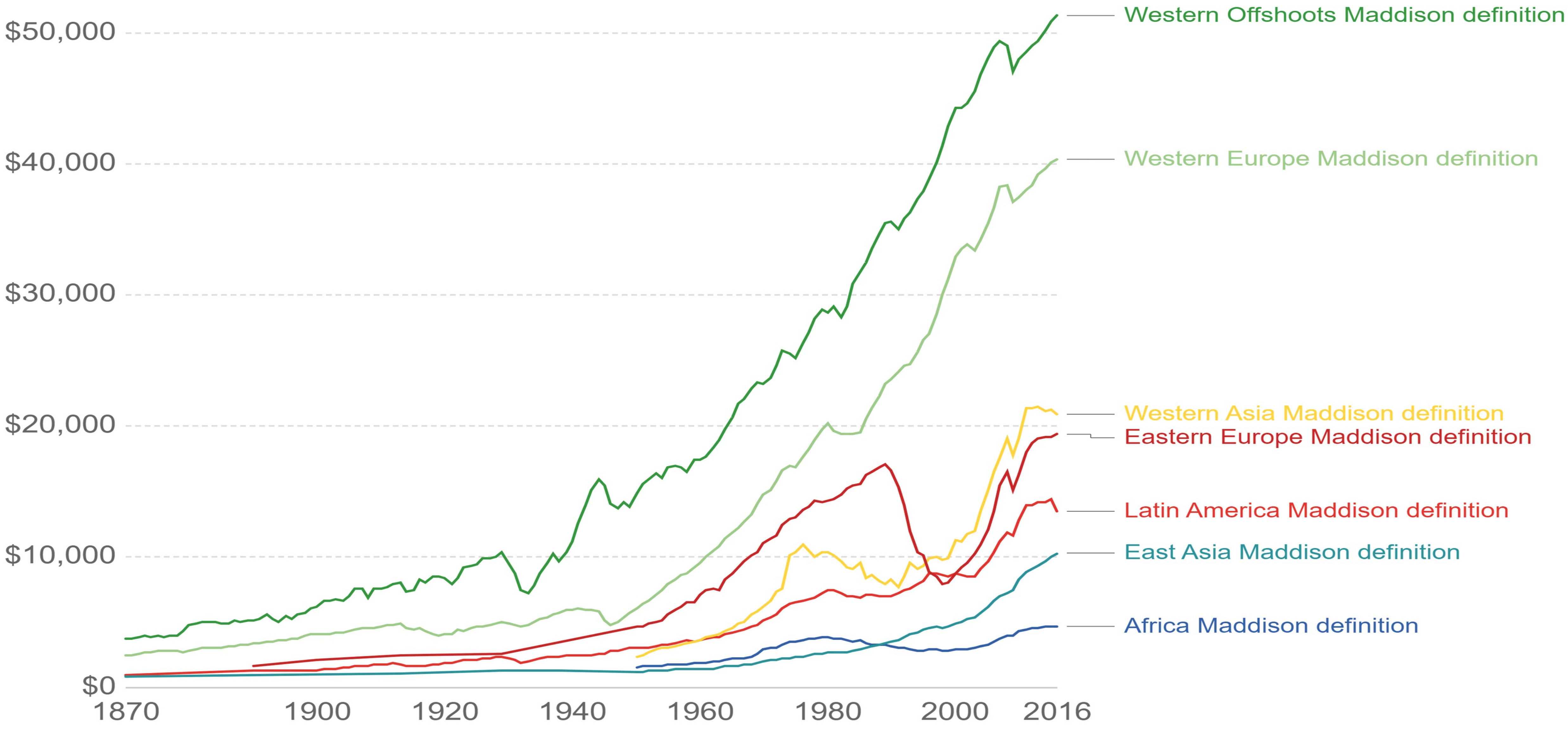



North Korea
Pyongyang
Sea of Japan
Seoul
South Korea
China
Yellow Sea
200 km
N


World GDP over the last two millennia
Total output of the world economy; adjusted for inflation and expressed in 2011 international dollars.
Our World in Data
$100 trillion
$80 trillion
$60 trillion
$40 trillion
$20 trillion
$0
1
500
1000
1500
2015
Source: World GDP - Our World In Data based on World Bank & Maddison (2017)
OurWorldInData.org/economic-growth • CC BY-SA

Average real GDP per capita across countries and regions

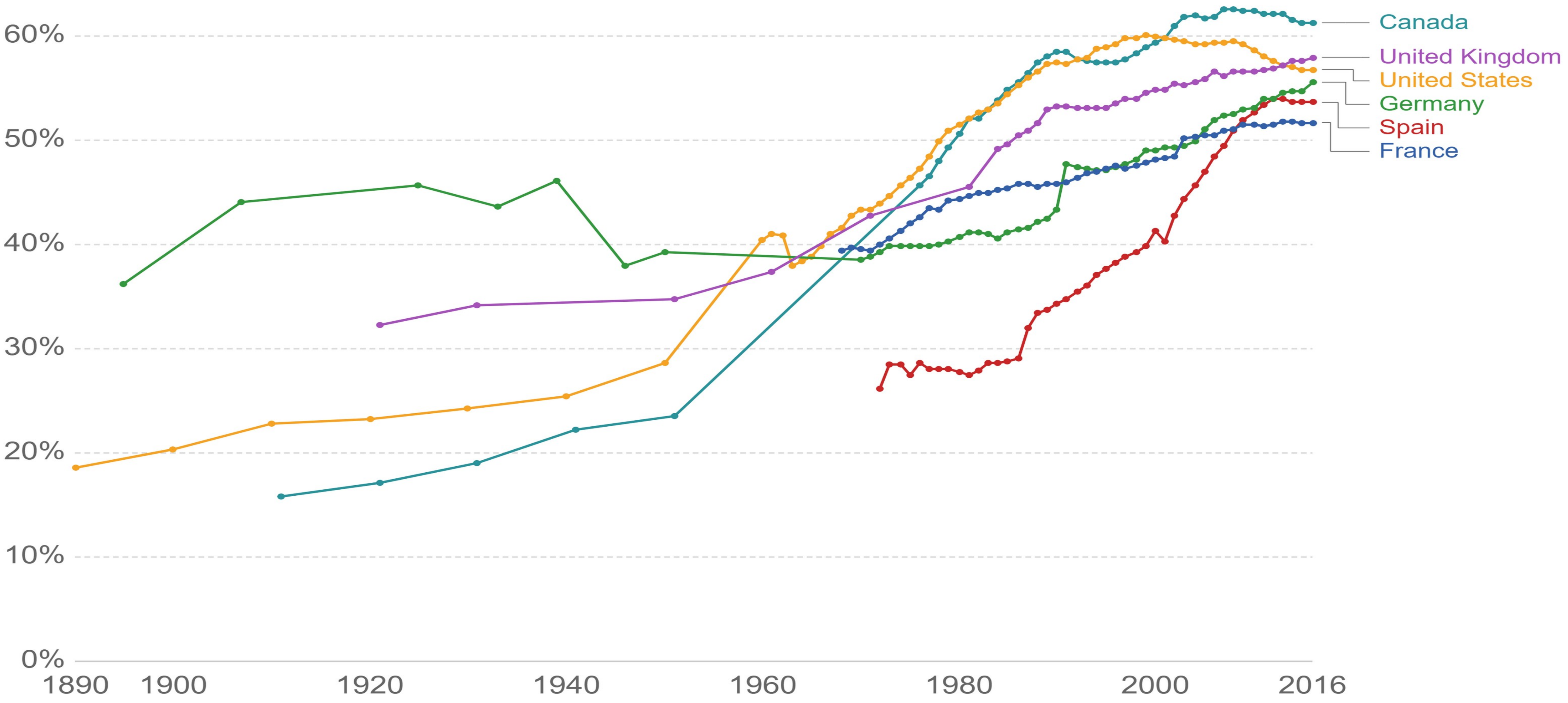
The measures are adjusted for inflation (at 2011 prices) and also for price differences between regions (multiple benchmarks allow for cross-country and regional income comparisons).



Source: Maddison Project Database (2018)

Long-run perspective on female labor force participation rates

Proportion of the female population ages 15 and over that is economically active. Data is available for OECD member countries, as well as for non-member countries publishing statistics in OECD.stats.

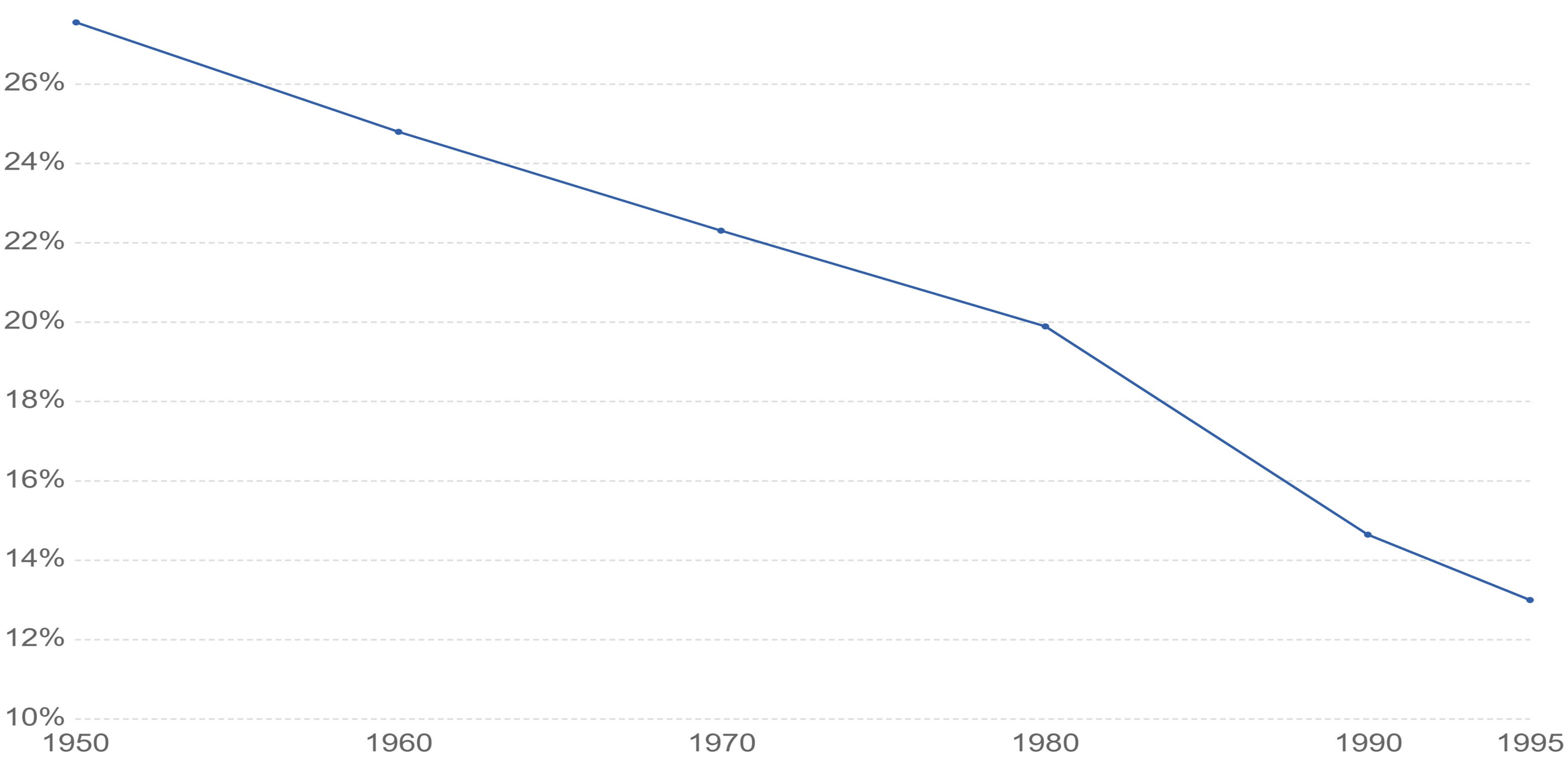


Source: Our World In Data based on OECD (2017) and Long (1958)

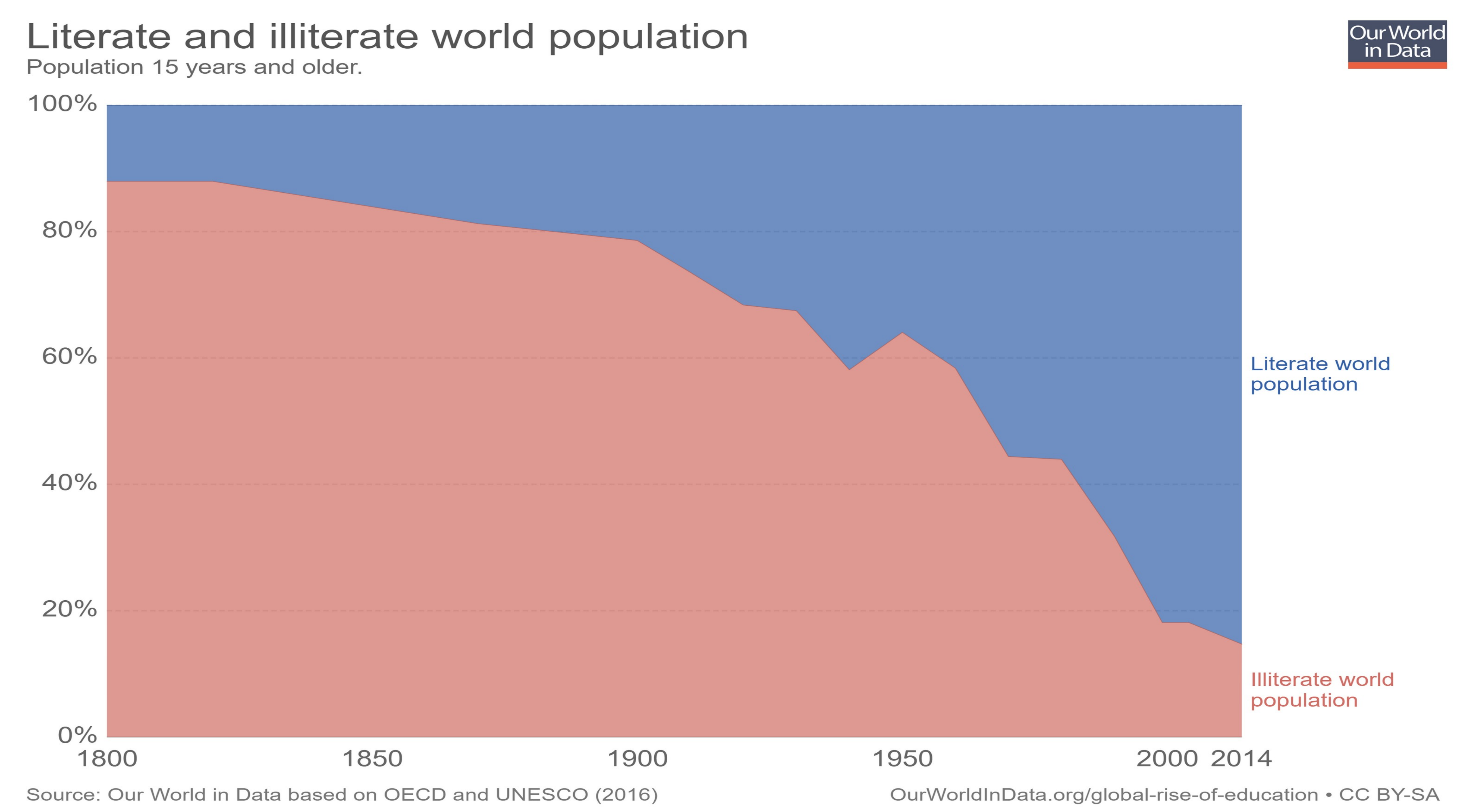
Note: For some observations prior 1960, the participation rate is taken with respect to the female population 14 and over. See sources for details.

Global labor force participation rates for children

Labor force participation of children, ages 10–14 (% of age group)

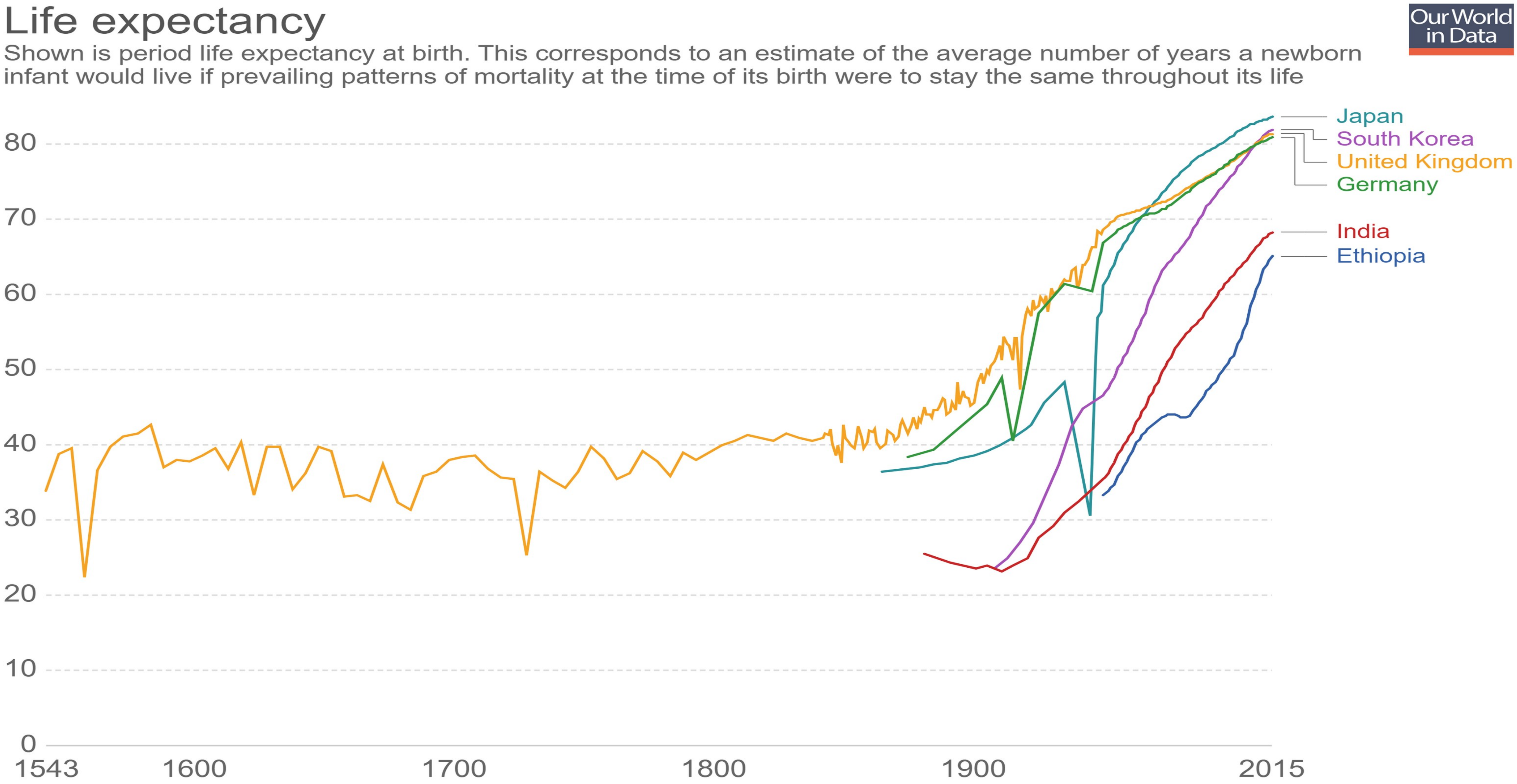


Source: Labor force participation rates - Basu (1999)

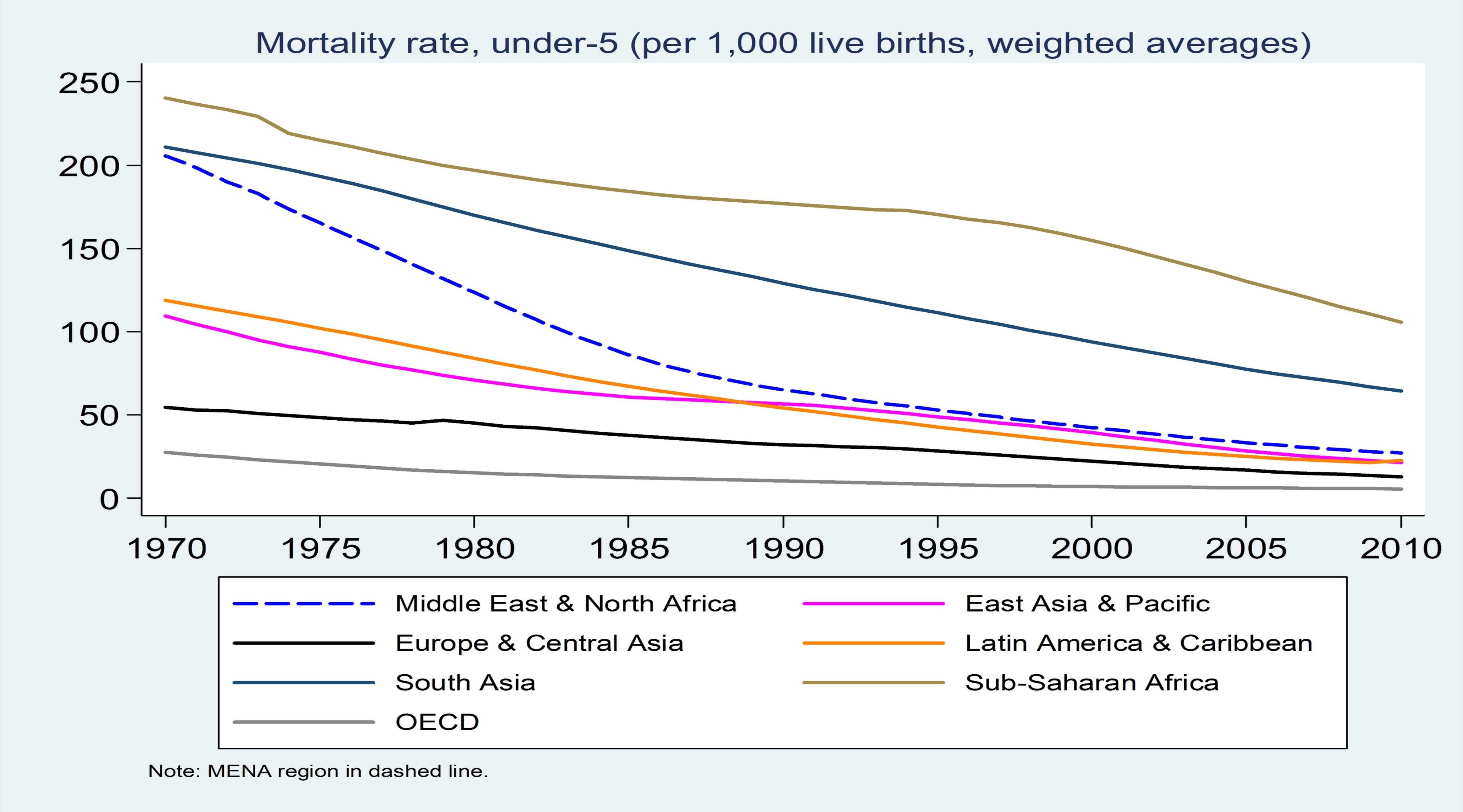

Literate and illiterate world population
Population 15 years and older.
Our World in Data
100%
80%
60%
40%
20%
0%
1800
1850
1900
1950
2000
2014
Literate world population
Illiterate world population
Source: Our World in Data based on OECD and UNESCO (2016)
OurWorldInData.org/global-rise-of-education • CC BY-SA

Life expectancy

Shown is period life expectancy at birth. This corresponds to an estimate of the average number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life



Source: Clio-Infra estimates until 1949; UN Population Division from 1950 to 2015
OurWorldInData.org/life-expectancy-how-is-it-calculated-and-how-should-it-be-interpreted/ •


Mortality rate, under-5 (per 1,000 live births, weighted averages)
250
200
150
100
50
0
1970
1975
1980
1985
1990
1995
2000
2005
2010
Middle East & North Africa
East Asia & Pacific
Europe & Central Asia
Latin America & Caribbean
South Asia
Sub-Saharan Africa
OECD
Note: MENA region in dashed line.

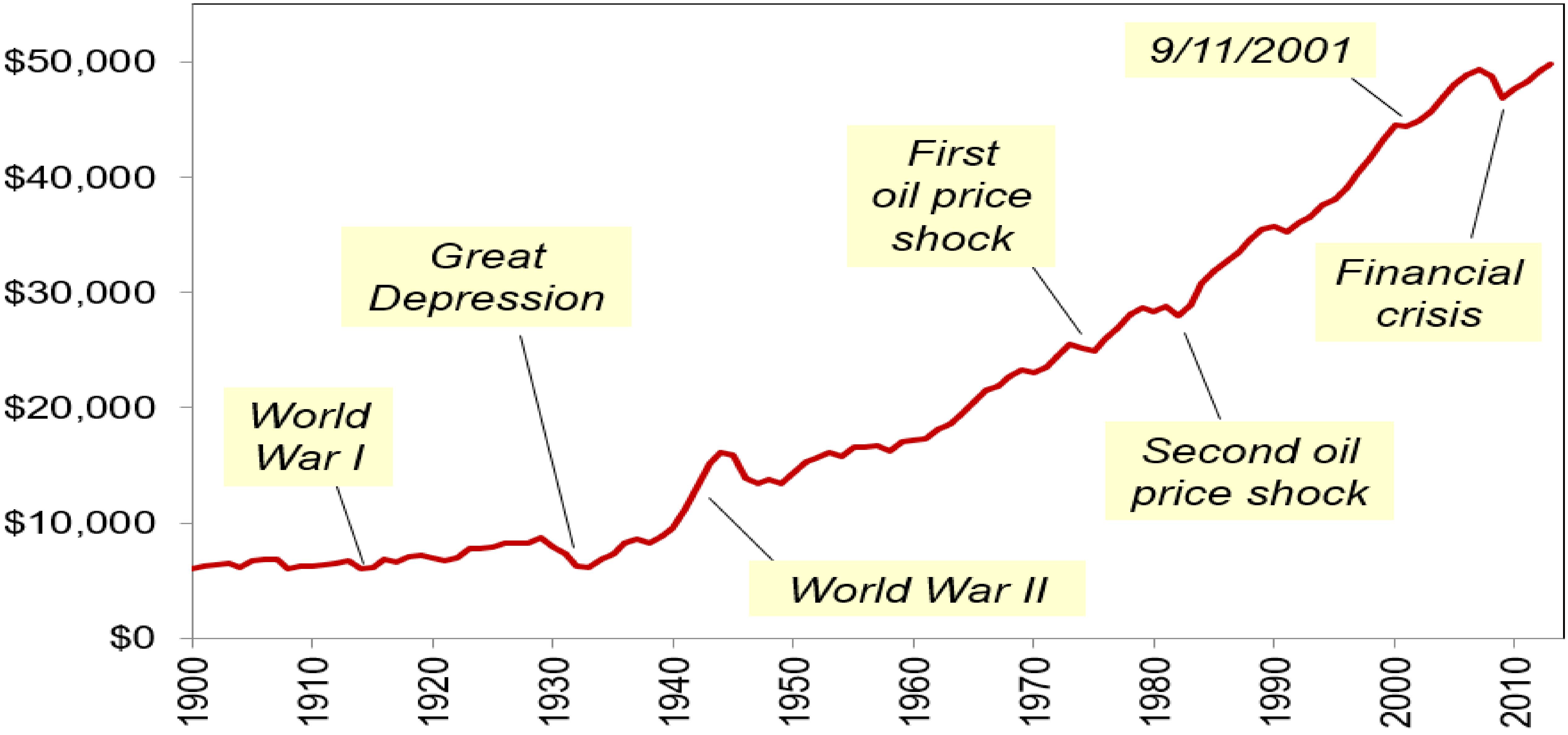
Measuring Macroeconomic Performance

- ***Gross Domestic Product*** (GDP): the total income of everyone in the economy, or the total output of all goods and services produced.
- ***Inflation Rate***: the rate at which prices increase over time.
- ***Unemployment Rate***: measures the percentage of the labor force out of work.
- Some macroeconomic measures can be used to find other macroeconomic measures.
  - Ex. #1: By controlling for inflation, we can utilize (Nominal) GDP to find REAL GDP.
  - Ex. #2: If we know the population, we can use Real GDP to find Real GDP PER CAPITA.

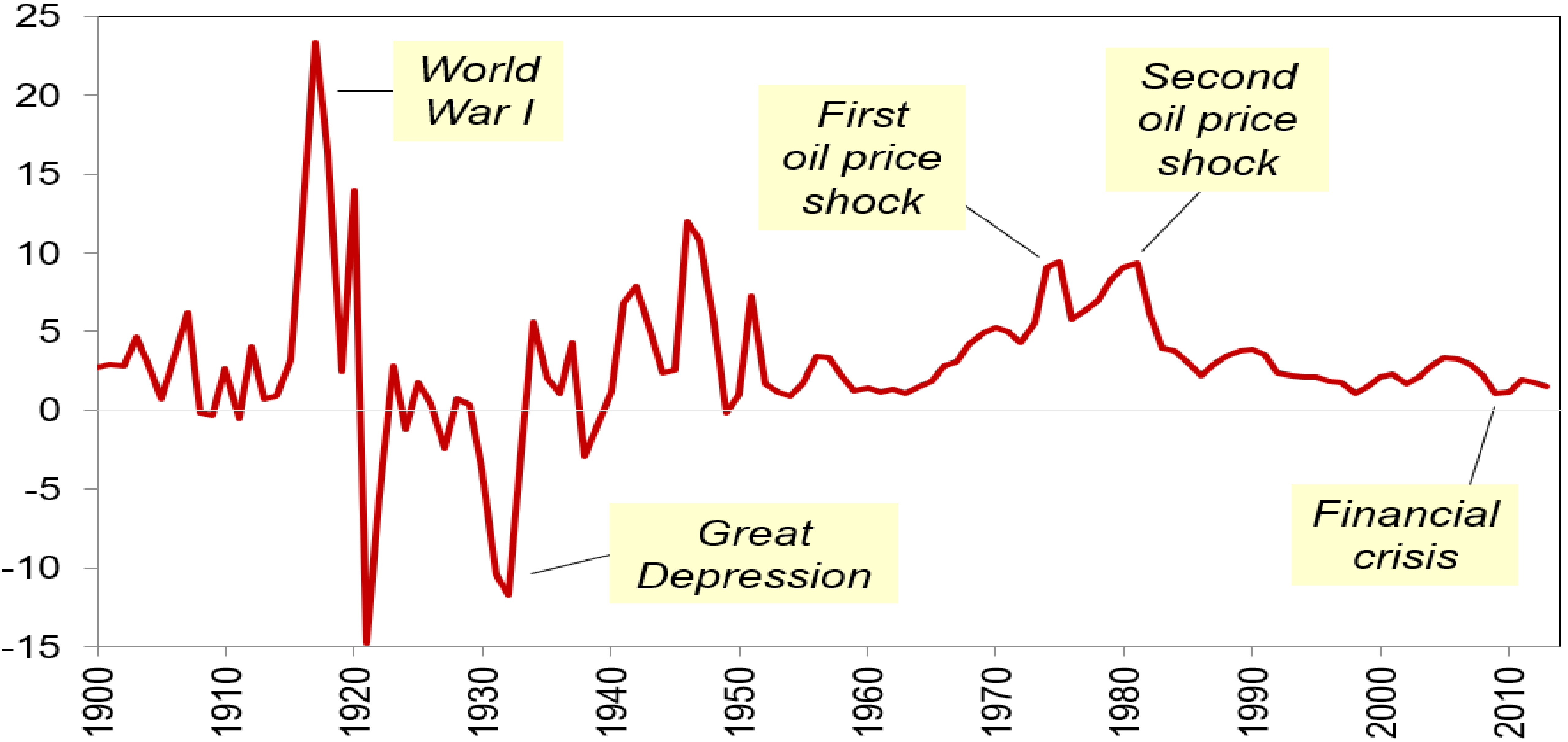




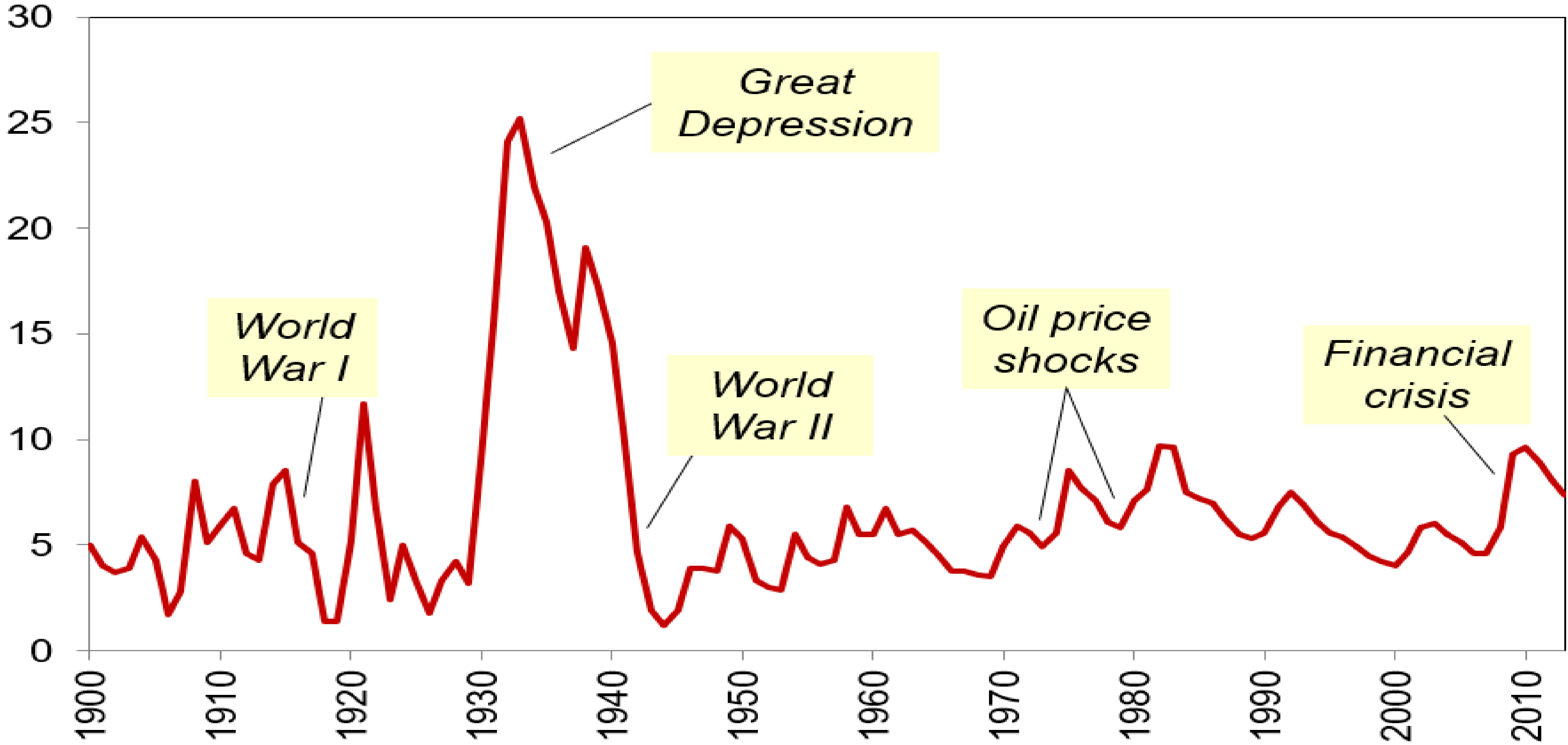
U.S. Real GDP per capita
(2009 dollars)



U.S. Inflation Rate
(% per year)

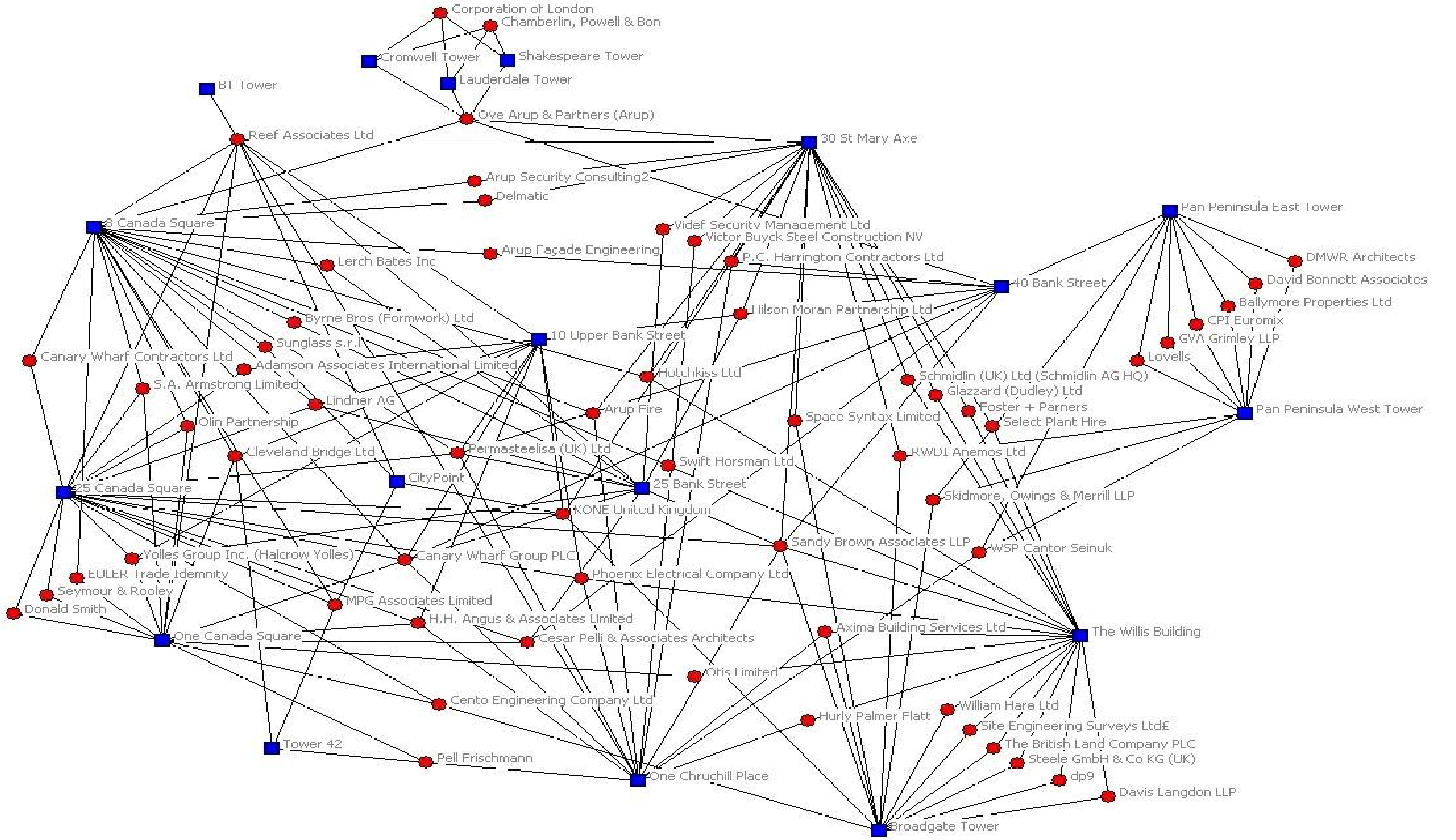


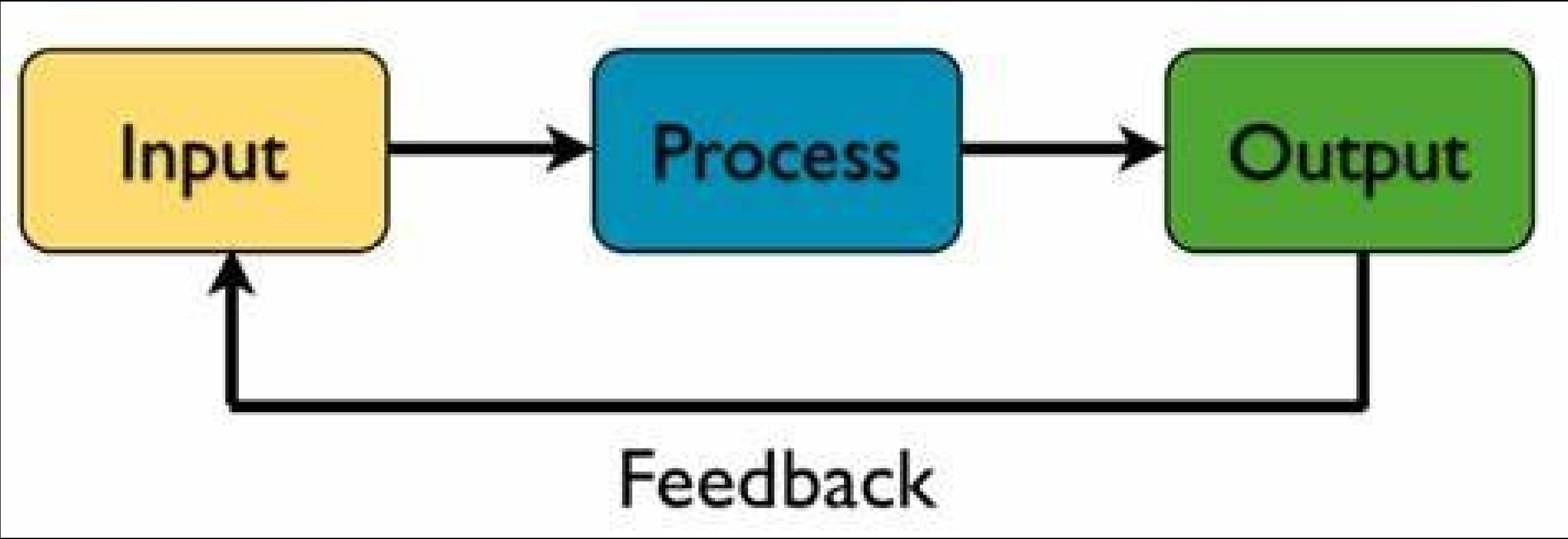
U.S. Unemployment Rate
(% of labor force)



Modelling, What is it Good For?

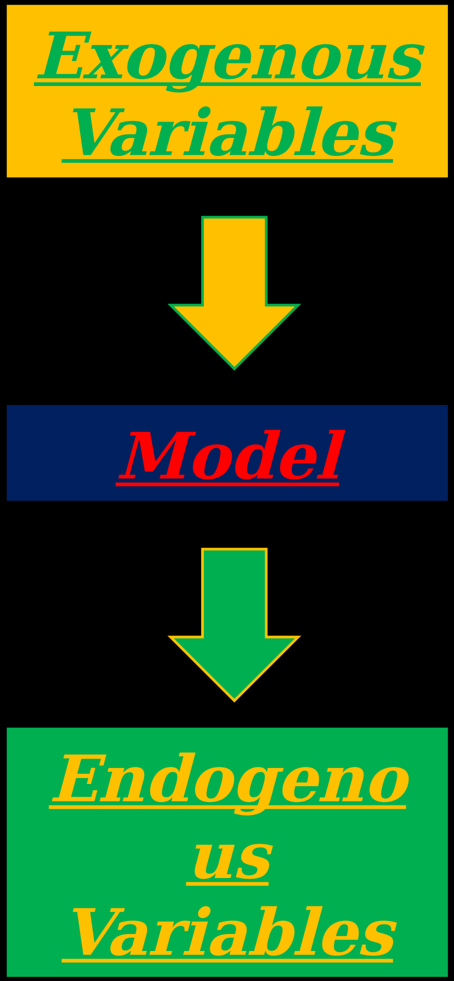
Absolutely… Something


Corporation of London
Chamberlin, Powell & Bon
Cromwell Tower
Shakespeare Tower
Lauderdale Tower
BT Tower
Ove Arup & Partners (Arup)
Reef Associates Ltd
30 St Mary Axe
Arup Security Consulting2
Delmatic
8 Canada Square
Pan Peninsula East Tower
Videf Security Management Ltd
Victor Buyck Steel Construction NV
Arup Façade Engineering
P.C. Harrington Contractors Ltd
Lerch Bates Inc
DMWR Architects
40 Bank Street
David Bonnett Associates
Ballymore Properties Ltd
Hilson Moran Partnership Ltd
Byrne Bros (Formwork) Ltd
CPI Euromix
10 Upper Bank Street
GVA Grimley LLP
Sunglass s.r.l
Canary Wharf Contractors Ltd
Lovells
Adamson Associates International Limited
Hotchkiss Ltd
Schmidlin (UK) Ltd (Schmidlin AG HQ)
S.A. Armstrong Limited
Glazzard (Dudley) Ltd
Lindner AG
Foster + Parners
Arup Fire
Pan Peninsula West Tower
Space Syntax Limited
Select Plant Hire
Olin Partnership
Cleveland Bridge Ltd
Permasteelisa (UK) Ltd
RWDI Anemos Ltd
Swift Horsman Ltd
CityPoint
25 Bank Street
25 Canada Square
Skidmore, Owings & Merrill LLP
KONE United Kingdom
Sandy Brown Associates LLP
WSP Cantor Seinuk
Yolles Group Inc. (Halcrow Yolles)
Canary Wharf Group PLC
EULER Trade Idemnity
Phoenix Electrical Company Ltd
Seymour & Rooley
MPG Associates Limited
Donald Smith
H.H. Angus & Associates Limited
Axima Building Services Ltd
The Willis Building
One Canada Square
Cesar Pelli & Associates Architects
Otis Limited
Cento Engineering Company Ltd
William Hare Ltd
Hurly Palmer Flatt
Site Engineering Surveys Ltd£
Tower 42
The British Land Company PLC
Pell Frischmann
Steele GmbH & Co KG (UK)
dp9
One Chruchill Place
Davis Langdon LLP
Broadgate Tower


Input
Process
Output
Feedback

What are Models, and Why are they Useful?

- Models are simplified theories that help us ***understand the world***.
  - "[M]odelling as a style of reasoning in economics works as a method of enquiry comprising probing questions, manipulations to provide demonstrations that are both deductive and experimental, and informal inference arguments involving elements of narrative that offer explanatory or interpretive services" (Morgan 2012, 37)
  - "In any case, that is what economists do. *We are storytellers, operating much of the time in worlds of make believe*. We do not find that the realm of imagination and ideas is an alternative to, or a retreat from, practical reality. On the contrary, it is the only way we have found to think seriously about reality" (Lucas 2011, 4)

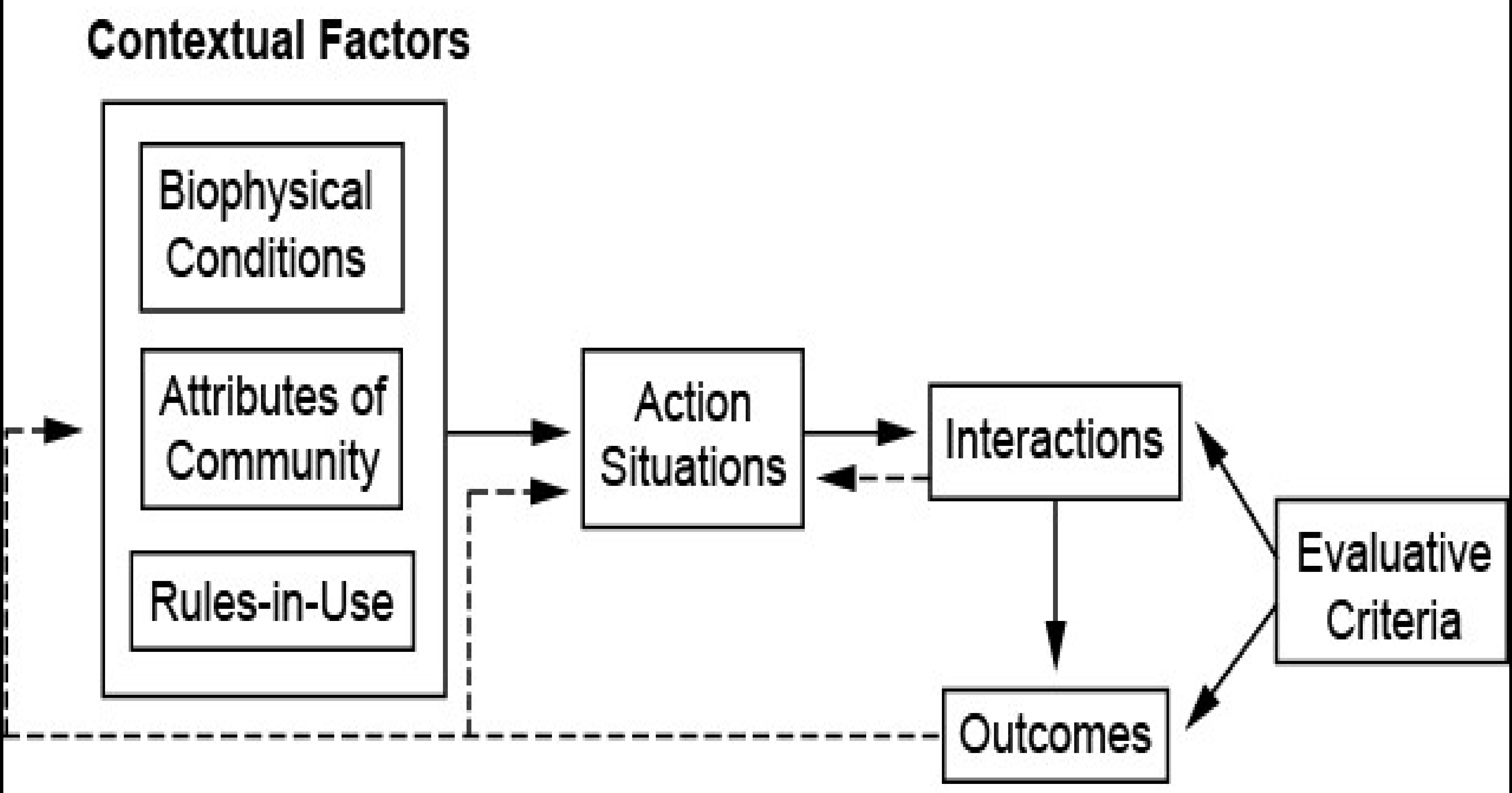


- Often written in ***mathematical*** terms, models help ***reveal relationships between different variables***.

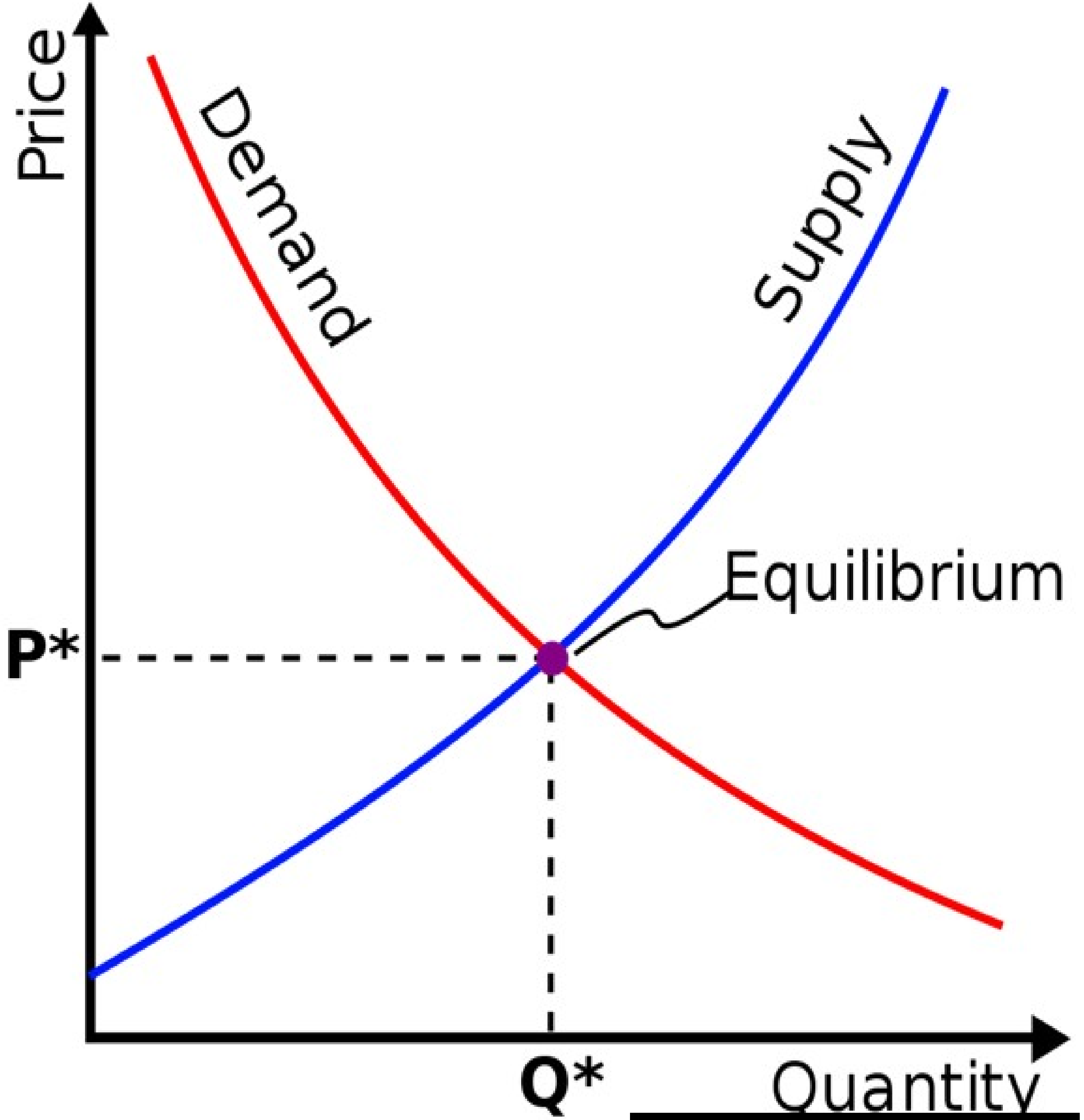
  - ***Exogenous variables*** are variables that the model ***takes as assumed or as given*** (i.e., what goes **IN** the model?)

  - ***Endogenous variables*** are variable that the model ***tries to explain*** (i.e., what comes **OUT** of the model?)

- Models can also be FUN!



Contextual Factors
Biophysical Conditions
Attributes of Community
Rules-in-Use
Action Situations
Interactions
Evaluative Criteria
Outcomes


Price
Demand
Supply
Equilibrium
P*
Q*
Quantity

Example: Supply and Demand

- When modelling a market using supply and demand, we rely on three functions:
  - is quantity demanded, is quantity supplied, is the price of the good, is the aggregate income, and is the price of the materials.

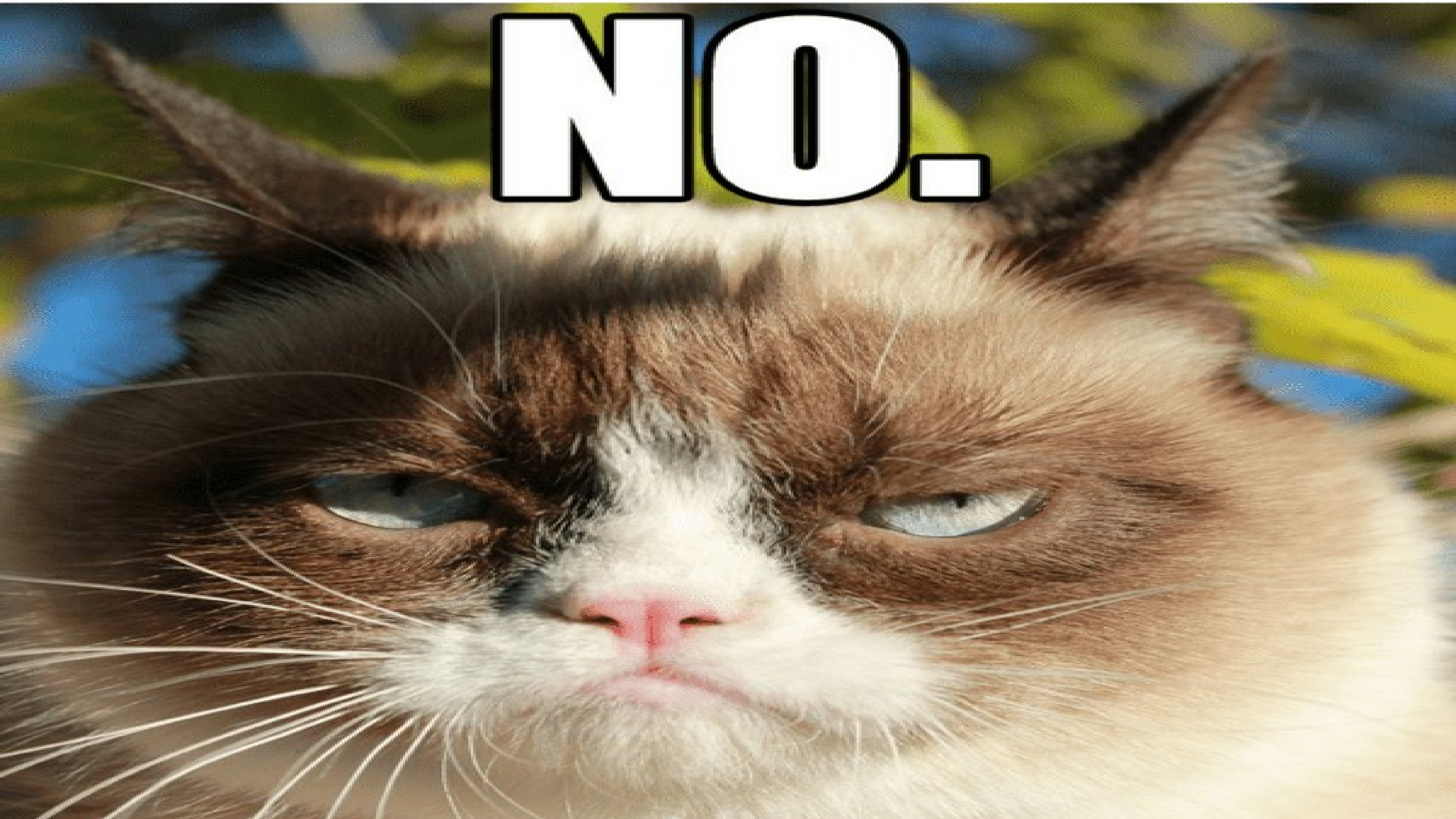
- Which variables are ***exogenous*** and which are ***endogenous***?

Example: Supply and Demand

- We can use *theory* alongside empirics.

- What is the effect of an increase of each of the exogenous variables on the endogenous variables?
  - An increase in decreases (recall First Law of Demand)
  - An increase in increases (recall Law of Supply)
  - An increase in decreases (more expensive materials increases costs)
  - An increase in could either increase or decrease (depends on whether a good is normal or inferior)


ONE MODEL
TO RULE THEM ALL?


NO.

One Model to Rule them All?

- No one model can explain all the questions that we may have to ask.

- Going to our previous supply and demand model.
  - *How* does a change in aggregate income affect the price and quantity of the good?
  - *Why* does aggregate income change in the first place?
  - Are there any other variables that we missed that may affect quantity demanded/supplied?
  - Answering these questions would require different economic models beyond the one we had.

- The progress of economic science involves explaining more economic phenomena by *endogenizing* what was once an *exogenous* variable (i.e., by *explaining* variables that were once merely *assumed* or *taken as given*)

What Assumptions Do We Make?

- Depends on the phenomenon we are trying to explain.

- Ex: Should we assume that prices are *flexible* or *sticky*? Do prices immediately respond to changes in exogenous variables, or do they take time to change?
  - Many models trying to explain ***long-run*** behavior assume continuous market-clearing, so they implicitly assume *flexible* prices.
  - Many models trying to explain ***short-run*** behavior do not assume continuous market-clearing, so they assume that prices are *sticky*.

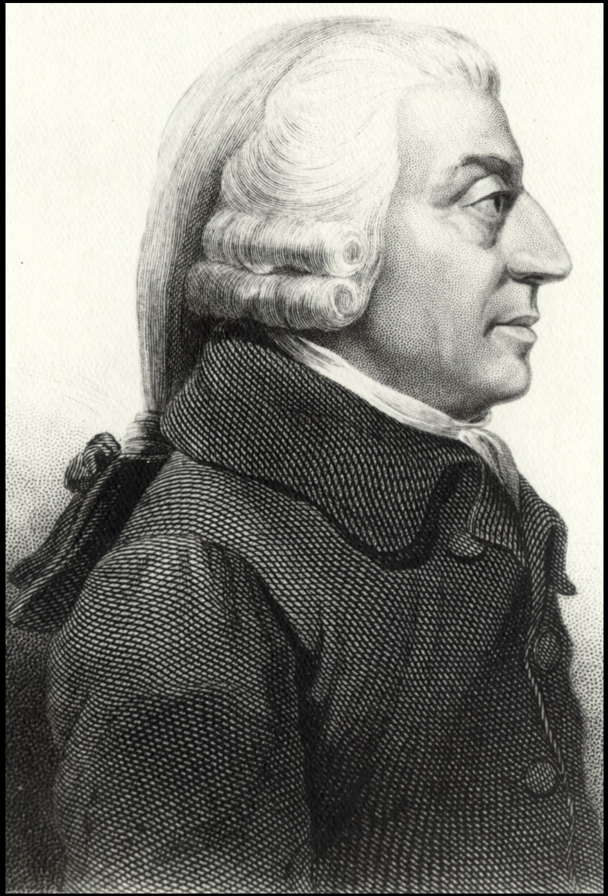
Different Theories have Different Answers

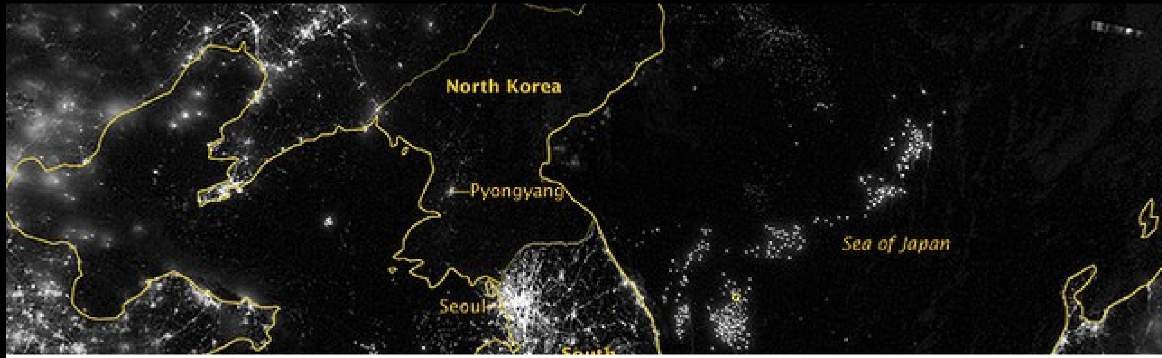
- Are prices sticky or flexible in the short-run?
  - Keynesians and New Keynesians would argue that prices are *sticky*.
  - New Classical economists would argue that prices are *flexible*.

- Is money neutral or non-neutral? Does a change in the money supply only affect nominal variables, or does it affect real (inflation-adjusted) variables as well?
  - New Classical economists would argue that money is always *neutral*.
  - Austrians would argue that money is always *non-neutral*.
  - Keynesians and Monetarists would argue that money is *non-neutral* in the short-run, but *neutral* in the long-run.

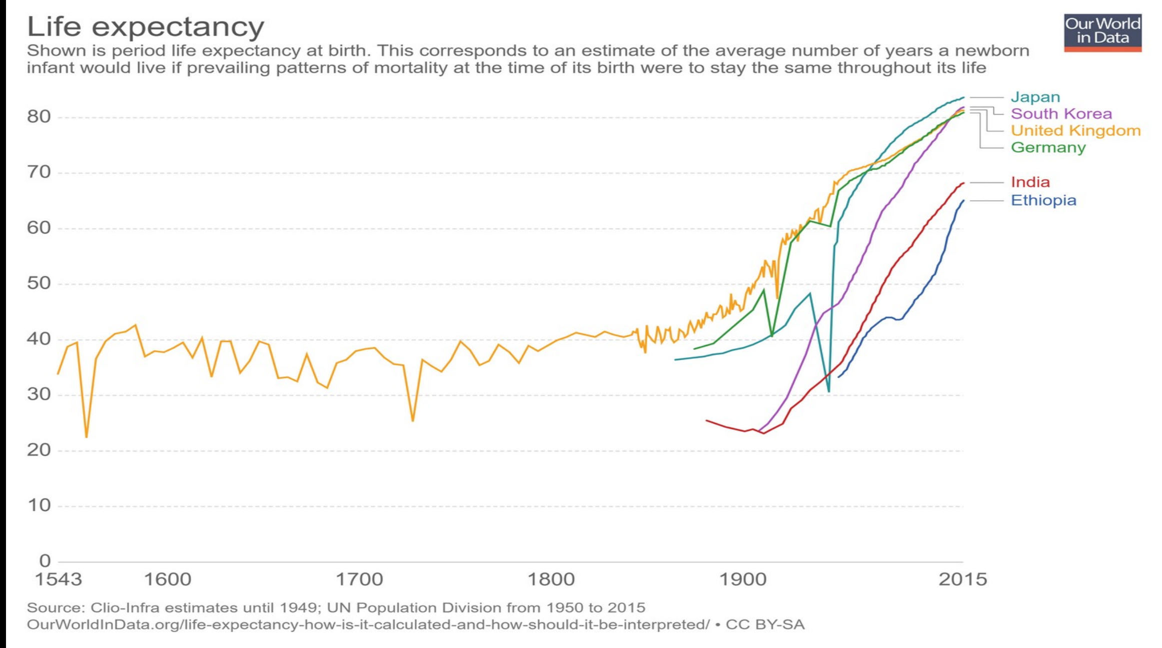
Remember the Goal

"Little is requisite to *carry a state to the highest degree of opulence from the lowest barbarism*, but peace, easy taxes, and a tolerable administration of justice" – Adam Smith









Conclusion:

- Macroeconomics helps us *understand the world around us* by understanding the "***What***", the "***Why***", and the "***How***" of economic phenomena.

- Models are ***simplified stories*** that help us understand a ***complex world***.
  - Different models treat different variables as exogenous or as endogenous.
  - Different models have different assumptions.
  - A model that is very useful in explaining one phenomenon may not be useful at explaining another phenomenon.

- Macroeconomic ***Concepts*** (ex: GDP, inflation, unemployment, recessions and depressions) ***describe*** the "***What***".

- Macroeconomic ***Theories*** (ex: Keynesian, Austrian, Monetarist) ***explain*** the "***Why***" and the "***How***".